cargo and hook load combined for each counterballasted condition.

§ 170.135 Operating information for a vessel with Type III subdivision.

(a) In addition to the information required in § 170.110, the stability booklet of a passenger vessel with Type III subdivision must contain the information required by Regulation 8(b) of IMO Resolution A.265 (VIII).

(b) International Maritime Organization Resolution A.265 (VIII) is incorporated by reference into this part.

(c) As used in IMO Resolution A.265 (VIII), *Administration* means the Commandant, U. S. Coast Guard.

Subpart E—Weather Criteria

§ 170.160 Specific applicability

(a) Except as provided in paragraphs (b) and (c) of this section, this subpart applies to each vessel.

(b) This subpart does not apply to any of the following vessels unless the stability of the vessel is questioned by the OCMI:

(1) A deck cargo barge that complies with the requirements in § 174.020 of this chapter.

(2) A tank vessel that only carries a product listed in § 30.25–1 of this chapter and that is—

(i) Less than 150 gross tons; or

(ii) A tank barge that operates only in river or lakes, bays, and sounds service.

(3) A sailing school vessel that is an open boat that complies with the requirements in § 173.063(e) of this subchapter.

(c) This subpart does not apply to the following vessels:

(1) A tank barge that carries a product listed in Table 151.01–10(b) of this chapter.

(2) A mobile offshore drilling unit.

(3) A vessel that performs the test required by § 171.030(c) of this subchapter.

[CGD 79–023, 48 FR 51010, Nov. 4, 1983, as amended by CGD 83–005, 51 FR 923, Jan. 9, 1986; CGD 85–080, 61 FR 944, Jan. 10, 1996]

§ 170.170 Calculations required.

(a) Each vessel must be shown by design calculations to have a metacentric height (GM) that is equal to or greater

than the following in each condition of loading and operation:

$$GM \geq \frac{PAH}{W \tan (T)}$$

Where—

P=.005+(L/14,200)² tons/ft² . . . for ocean service, Great Lakes winter service, or service on exposed waters.

P=.055+(L/1309)² metric tons/m² . . . for ocean service, Great Lakes winter service, or service on exposed waters.

P=.0033+(L/14,200)² tons/ft² . . . for Great Lakes summer service or service on partially protected waters.

P=.036+(L/1309)² metric tons/m² . . . for Great lakes summer service or service on partially protected waters.

P=.0025+(L/14,200)² tons/ft² . . . for service on protected waters.

P=.028+(L/1309)² metric tons/m² . . . for service on protected waters.

L=LBP in feet (meters).

A=projected lateral area in square feet (square meters) of the portion of the vessel and deck cargo above the waterline.

H=the vertical distance in feet (meters) from the center of A to the center of the underwater lateral area or approximately to the one-half draft point.

W=displacement in long (metric) tons.

T=either:

(1) the lesser of either 14 degrees heel or the angle of heel in degrees at which one-half the freeboard to the deck edge is immersed; or

(2) for a sailing vessel, T = the lesser of either 14 degrees or the angle of heel in degrees to the deck edge.

The deck edge is to be taken as the intersection of the sideshell and the uppermost continuous deck below which the sideshell is weathertight.

(b) If approved by the Commanding Officer, Marine Safety Center, a larger value of T may be used for a vessel with a discontinuous weather deck or abnormal sheer.

(c) When doing the calculations required by paragraph (a) of this section for a sailing vessel or auxiliary sailing vessel, the vessel must be assumed—

(1) To be under bare poles; or

(2) If the vessel has no auxiliary propulsion, to have storm sails set and trimmed flat.

(d) The criterion specified in this section is complete for flush deck vessels of ordinary proportion and form that carry cargo below the weather deck. For other types of vessels, calculations

in addition to those in paragraph (a) of this section are required. For a vessel under 100 meters (328 feet) in length, other than a tugboat or a towboat, the requirements in §170.173 apply.

§170.173 Criterion for vessels of unusual proportion and form.

(a) If required by the Commander (mmt), each mechanically powered vessel less than 328 feet (100 meters) LLL, other than a tugboat or towboat, must be shown by design calculations to comply with—

(1) Paragraph (b) or (c) of this section if the maximum righting arm occurs at an angle of heel less than or equal to 30 degrees; or

(2) Paragraph (b) of this section if the maximum righting arm occurs at an angle of heel greater than 30 degrees.

(b) Each vessel must have—

(1) An initial metacentric height (GM) of at least 0.49 feet (0.15 meters);

(2) A righting arm (GZ) of at least 0.66 feet (0.20 meters) at an angle of heel equal to or greater than 30 degrees;

(3) A maximum righting arm that occurs at an angle of heel not less than 25 degrees;

(4) An area under each righting arm curve of at least 10.3 foot-degrees (3.15 meter-degrees) up to an angle of heel of 30 degrees;

(5) An area under each righting arm curve of at least 16.9 foot-degrees (5.15 meter-degrees) up to an angle of heel of 40 degrees or the downflooding angle, whichever is less; and

(6) An area under each righting arm curve between the angles of 30 degrees and 40 degrees, or between 30 degrees and the downflooding angle if this angle is less than 40 degrees, of not less than 5.6 foot-degrees (1.72 meter-degrees).

(c) Each vessel must have—

(1) An initial metacentric height (GM) of at least 0.49 feet (0.15 meters);

(2) A maximum righting arm that occurs at an angle of heel not less than 15 degrees;

(3) An area under each righting arm curve of at least 16.9 foot-degrees (5.15 meter-degrees) up to an angle of heel of 40 degrees or the downflooding angle, whichever is less;

(4) An area under each righting arm curve between the angles of 30 degrees and 40 degrees, or between 30 degrees and the downflooding angle if this angle is less than 40 degrees, of not less than 5.6 foot-degrees (1.72 meter-degrees); and

(5) An area under each righting arm curve up to the angle of maximum righting arm of not less than the area determined by the following equation:

$$A = 10.3 + 0.187 \, (30 - Y) \text{ foot-degrees}$$

$$A = 3.15 + 0.057 \, (30 - Y) \text{ meter-degrees}$$

where—
A=area in foot-degrees (meter-degrees).
Y=angle of maximum righting arm, degrees.

(d) For the purpose of demonstrating compliance with paragraphs (b) and (c) of this section, at each angle of heel a vessel's righting arm is calculated after the vessel is permitted to trim free until the trimming moment is zero.

Subpart F—Determination of Lightweight Displacement and Centers of Gravity

§170.174 Specific applicability.

This subpart applies to each vessel for which the lightweight displacement and centers of gravity must be determined in order to do the calculations required in this subchapter.

§170.175 Stability test: General.

(a) Except as provided in paragraphs (c) and (d) of this section and in §170.200, the owner of a vessel must conduct a stability test of the vessel and calculate its vertical and longitudinal centers of gravity and its lightweight displacement.

(b) An authorized Coast Guard representative must be present at each stability test conducted under this section.

(c) The stability test may be dispensed with, or a deadweight survey may be substituted for the stability test, if the Coast Guard has a record of,